WEST Search History

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DATE: Monday, January 05, 2004

Hide?	Set Name	Query	Hit Count
		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ	
☐	L25	aldehyde dehydrogenase and glycerol dehydratase.clm.	3
☐	L24	ald2	23
☐	L23	L22 and ald2	0
☐	L22	ALDH4	10
☐	L21	3-hydroxypropionic acid and aldB	0
☐	L20	3-hydroxypropionic acid and aldA	0
☐	L19	3-hydroxypropionic acid and ALD2	0
☐	L18	3-hydroxypropionic acid and ALD2 and dhaB	0
☐	L17	3-hydroxypropionic acid and ALD2 and dhaB and Klebsiella pneumoniae	0
☐	L16	3-hydroxypropionic acid and ALDH4 and dhaB and Klebsiella pneumoniae	0
☐	L15	3-hydroxypropionic acid and aldehyde dehydrogenase and dhaB and Klebsiella pneumoniae	4
☐	L14	3-hydroxypropionic acid and aldehyde dehydrogenase and dhaB and Klebsiella	4
☐	L13	3-hydroxypropionic acid and aldehyde dehydrogenase and dhaB and Klebsiella	4
☐	L12	3-hydroxypropionic acid and aldehyde dehydrogenase and glycerol dehydratase	4
☐	L11	3-hydroxypropionic acid and aldehyde dehydrogenase and glyceroldehydratase	0
☐	L10	L8 and recombinant	6
☐	L9	L8 and host cell?	0
☐	L8	3-hydroxypropionic acid and aldehyde dehydrogenase	8
☐	L7	host cell and aldehyde glycerol	0
☐	L6	3-hydroxypropionic acid and aldehyde glycerol	0
☐	L5	aldehyde glycerol	48
☐	L4	aldehyhyde glycerol	0
☐	L3	3-hydroxypropionic acid and aldehyhyde glycerol	0
☐	L2	3-hydroxypropionic acid and glycerol dehydratase and aldehyhyde glycerol	0
☐	L1	3-hydroxypropionic acid and glycerol dehydratase	4

END OF SEARCH HISTORY

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=> d l3 1-2 ibib ab

L3 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:168167 CAPLUS
DOCUMENT NUMBER: 134:221529
TITLE: Production of **3-hydroxypropionic acid** in recombinant organisms
INVENTOR(S): Suthers, Patrick F.; Cameron, Douglas C.
PATENT ASSIGNEE(S): Wisconsin Alumni Research Foundation, USA
SOURCE: PCT Int. Appl., 63 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001016346	A1	20010308	WO 2000-US23878	20000830
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1124979	A1	20010822	EP 2000-959652	20000830
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, MC, IE, SI, LT, LV, FI, RO				
BR 2000008355	A	20020716	BR 2000-8355	20000830

PRIORITY APPLN. INFO.: US 1999-151440P P 19990830
WO 2000-US23878 W 20000830

AB The prodn. of **3-hydroxypropionic acid** (3-HP) from glycerol in a bacterial host is described. 3-HP is a useful feedstock for the prodn. of polymeric materials. The genetic engineering of a bacterial host with two enzymes is sufficient to enable prodn. of 3-HP. One enzyme is a **glycerol dehydratase** and the other is an **aldehyde dehydrogenase**.

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 2 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN
ACCESSION NUMBER: 2001-10823 BIOTECHDS
TITLE: **3-Hydroxypropionic acid** preparation, for use in e.g. as monomer, by fermenting recombinant microorganisms expressing genes for suitable enzymes in the presence of glycerol or glucose; plasmid pPSF18-mediated Klebsiella pneumoniae dhaB, **glycerol-dehydratase** or **aldehyde -dehydrogenase** gene transfer and expression in Escherichia coli for prosthetics
AUTHOR: Suthers P F; Cameron D C
PATENT ASSIGNEE: Wisconsin-Alumni-Res.Found.
LOCATION: Madison, WI, USA.
PATENT INFO: WO 2001016346 8 Mar 2001
APPLICATION INFO: WO 2000-US23878 30 Aug 2000
PRIORITY INFO: US 1999-151440 30 Aug 1999
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 2001-315988 [33]
AB A method for the production of **3-hydroxypropionic acid** (I) is new and involves fermenting a recombinant microorganism in the presence of a source of glycerol (II) or glucose,

where the microorganism: expresses genes for non-native enzymes which catalyze the production of (I) from (II); carries genetic constructs (e.g. plasmid pPSF18) for the expression of a **glycerol-dehydratase** (GDHT, EC-4.2.1.30) and an **aldehyde-dehydrogenase** (ADH) capable of catalyzing the production of (I) from (II); or carries a genetic construct which expresses the dhaB gene from Klebsiella pneumoniae and a gene for an ADH capable of catalyzing the production of (I) from (II). Also claimed are: a recombinant Escherichia coli host containing, in its inheritable genetic materials, foreign genes encoding a GDHT and an ADH, so that the host can produce (I) from (II); a recombinant Escherichia coli host containing the dhaB gene from K. pneumoniae and an ADH; and a bacterial host containing a genetic construct expressing GDHT and an ADH enzyme. (I) is a monomer, and is useful e.g. in the production of absorbable prosthetic devices and surgical sutures. (63pp)

```
=> s aldehyde dehydrogenase and dhaB and 3-hydroxypropionic acid
L4            2 ALDEHYDE DEHYDROGENASE AND DHAB AND 3-HYDROXYPROPIONIC ACID

=> s aldh4 and dhaB and 3-hydroxypropionic acid
L5            0 ALDH4 AND DHAB AND 3-HYDROXYPROPIONIC ACID

=> s aldh4 and dhaB
L6            0 ALDH4 AND DHAB

=> s aldh4
L7           37 ALDH4

=> dup rem l7
PROCESSING COMPLETED FOR L7
L8           13 DUP REM L7 (24 DUPLICATES REMOVED)

=> focus l8
PROCESSING COMPLETED FOR L8
L9           13 FOCUS L8 1-

=> d l9 1-5 ibib ab

L9   ANSWER 1 OF 13     MEDLINE on STN
ACCESSION NUMBER:   2002124372     MEDLINE
DOCUMENT NUMBER:    21839899   PubMed ID: 11849595
TITLE:              Novel ABA- and dehydration-inducible aldehyde dehydrogenase
                    genes isolated from the resurrection plant Craterostigma
                    plantagineum and Arabidopsis thaliana.
AUTHOR:             Kirch H H; Nair A; Bartels D
CORPORATE SOURCE:   Institute of Botany, University of Bonn, Kirschallee 1,
                    53115 Bonn, Germany.. hhkirch@uni-bonn.de
SOURCE:             PLANT JOURNAL, (2001 Dec) 28 (5) 555-67.
                    Journal code: 9207397. ISSN: 0960-7412.
PUB. COUNTRY:       England: United Kingdom
DOCUMENT TYPE:      Journal; Article; (JOURNAL ARTICLE)
LANGUAGE:           English
FILE SEGMENT:       Priority Journals
OTHER SOURCE:       GENBANK-AJ306960; GENBANK-AJ306961
ENTRY MONTH:        200203
ENTRY DATE:         Entered STN: 20020226
                    Last Updated on STN: 20020320
                    Entered Medline: 20020319
```

AB In order to identify genes that are critical for the ABA-dependent stress response in the resurrection plant Craterostigma plantagineum, a gene was isolated with homology to class 3 variable substrate aldehyde dehydrogenases (ALDH). The C. plantagineum gene Cp-ALDH constitutes a novel class of plant ALDHs. In a search for corresponding genes from Arabidopsis thaliana, Ath-ALDH3 and Ath-**ALDH4** were isolated,

showing 70% and 80% similarity to Cp-ALDH. Phylogenetically, the Cp- and Ath-ALDH3 and -**ALDH4** proteins are closely related to aldehyde dehydrogenases from bacteria and mammalian species and are separated from known plant ALDHs and betaine-aldehyde dehydrogenases (BADH). Cp-ALDH transcript and polypeptide are up-regulated in vegetative tissues and callus in response to dehydration or ABA-treatment. Ath-ALDH3 expression was induced in response to dehydration and ABA treatment, while Ath-**ALDH4** is constitutively expressed at a low level. Recombinant Cp-ALDH protein oxidizes nonanal, propionaldehyde and acetaldehyde, with Km values of 2.2 microm, 0.27 mm and 3.23 mm, respectively, in an NAD-dependent manner. Immunogold electron microscopy shows that Cp-ALDH is localized in plastids.

L9 ANSWER 2 OF 13 MEDLINE on STN
ACCESSION NUMBER: 90323218 MEDLINE
DOCUMENT NUMBER: 90323218 PubMed ID: 2373201
TITLE: Developmental changes of aldehyde dehydrogenase isozymes in human livers: mitochondrial ALDH2 isozyme is expressed in fetal livers.
AUTHOR: Yoshida A; Shibuya A; Dave V; Nakayama M; Hayashi A
CORPORATE SOURCE: Department of Biochemical Genetics, Beckman Research Institute, City of Hope, Duarte, California 91010.
CONTRACT NUMBER: AA05763 (NIAAA)
SOURCE: EXPERIENTIA, (1990 Jul 15) 46 (7) 747-50.
Journal code: 0376547. ISSN: 0014-4754.
PUB. COUNTRY: Switzerland
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199008
ENTRY DATE: Entered STN: 19901012
Last Updated on STN: 19901012
Entered Medline: 19900830

AB Previous reports suggested that the major cytosolic aldehyde dehydrogenase (ALDH1) was present in fetal and infant livers, but the major mitochondrial isozyme (ALDH2) was absent or severely diminished. Re-examination by means of starch gel electrophoresis followed by enzyme activity staining, and by means of dot blot immuno-hybridization of liver samples with known genotypes of the ALDH2 locus, indicated that both ALDH1 and ALDH2 genes are expressed in fetal and infant livers. In addition, **ALDH4** isozyme was also observed. The results imply that a fetus with the 'usual' homozygous ALDH1(2)/ALDH1(2) genotype, but not one with the atypical ALDH1(2)/ALDH2(2) or ALDH2(2)/ALDH2(2), is capable of detoxifying acetaldehyde transferred from the mother.

L9 ANSWER 3 OF 13 MEDLINE on STN
ACCESSION NUMBER: 90232198 MEDLINE
DOCUMENT NUMBER: 90232198 PubMed ID: 3273605
TITLE: [Human aldehyde dehydrogenase in a sample of the Costa Rican population].
Aldehido deshidrogenasa humana en una muestra de la poblacion costarricense.
AUTHOR: Santisteban I; Baudrit Gomez F
CORPORATE SOURCE: Instituto de Investigaciones en Salud, Universidad de Costa Rica.
SOURCE: REVISTA DE BIOLOGIA TROPICAL, (1988 Nov) 36 (2B) 559-62.
Journal code: 0404267. ISSN: 0034-7744.
PUB. COUNTRY: Costa Rica
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: Spanish
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199005
ENTRY DATE: Entered STN: 19900706
Last Updated on STN: 19900706
Entered Medline: 19900529

AB This is an electrophoretic study of ALDH isozymes in post-mortem tissue extracts. Three different electrophoretic variants of the isozyme ALDH3 were found in the 100 individuals examined. One liver sample showed lack of ALDH1 activity, but it remains unknown whether this is due to genetic mechanisms. The other two isozymes--ALDH2 and **ALDH4**--did not show any variations.

L9 ANSWER 4 OF 13 MEDLINE on STN
ACCESSION NUMBER: 1998149669 MEDLINE
DOCUMENT NUMBER: 98149669 PubMed ID: 9490025
TITLE: Human aldehyde dehydrogenase gene family.
AUTHOR: Yoshida A; Rzhetsky A; Hsu L C; Chang C
CORPORATE SOURCE: Beckman Research Institute of the City of Hope, Duarte, CA 91010, USA.
CONTRACT NUMBER: GM20293 (NIGMS)
HL-29515 (NHLBI)
SOURCE: EUROPEAN JOURNAL OF BIOCHEMISTRY, (1998 Feb 1) 251 (3) 549-57. Ref: 77
Journal code: 0107600. ISSN: 0014-2956.
PUB. COUNTRY: GERMANY: Germany, Federal Republic of
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, ACADEMIC)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199803
ENTRY DATE: Entered STN: 19980407
Last Updated on STN: 19980407
Entered Medline: 19980323

AB Twelve aldehyde dehydrogenase (ALDH) genes have been identified in humans. These genes, located on different chromosomes, encode a group of enzymes which oxidizes varieties of aliphatic and aromatic aldehydes. Metabolic disorders and clinical problems associated with mutations of ALDH1, ALDH2, **ALDH4**, ALDH10 and succinic semialdehyde (SSDH) genes have been emerged. Comparison of the human ALDHs indicates a wide range of divergency (> 80 - < 15% identity at the protein sequence level) among them. However, several protein regions, some of which are implicated in functional activities, are conserved in the family members. The phylogenic tree constructed of 56 ALDH sequences of humans, animals, fungi, protozoa and eubacteria, suggests that the present-day human ALDH genes were derived from four ancestral genes that existed prior to the divergence of Eubacteria and Eukaryotes. The neighbor-joining tree derived from 12 human ALDHs and antiquitin indicates that diversification within the ALDH1/2/5/6 gene cluster occurred during the Neoproterozoic period (about 800 million years ago). Duplication in the ALDH 3/10/7/8 gene cluster occurred in Phanerozoic period (about 300 million years ago). Separations of ALDH3/ALDH10 and that of ALDH7/ALDH8 had occurred during the period of appearance and radiation of mammalian species.

L9 ANSWER 5 OF 13 MEDLINE on STN
ACCESSION NUMBER: 95351519 MEDLINE
DOCUMENT NUMBER: 95351519 PubMed ID: 7625577
TITLE: Polymorphism of a class 3 aldehyde dehydrogenase present in human saliva and in hair roots.
AUTHOR: Dyck L E
CORPORATE SOURCE: Department of Psychiatry, College of Medicine, University of Saskatchewan, Saskatoon, Canada.
SOURCE: ALCOHOLISM, CLINICAL AND EXPERIMENTAL RESEARCH, (1995 Apr) 19 (2) 420-6.
Journal code: 7707242. ISSN: 0145-6008.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199508

ENTRY DATE: Entered STN: 19950911
Last Updated on STN: 19950911
Entered Medline: 19950829

AB The types of aldehyde dehydrogenases (ALDH) present in human hair roots and in saliva were investigated. ALDH was detected by activity staining following separation of crude extracts by isoelectric focusing. Hair roots were found to express ALDH1, ALDH2, ALDH3, and **ALDH4**, whereas saliva expressed ALDH3. Two different patterns of ALDH3 were detected in hair roots collected from 42 donors, 40 expressed one pattern (variant I) and two another pattern (variant II) of activity staining. The variant I pattern of hair root ALDH3 changed with repetitive freezing and thawing of the sample, whereas the variant II pattern was stable. In contrast to hair root ALDH3, all patterns of ALDH3 activity in saliva were stable. The patterns of ALDH3 activity present in human hair roots that had been frozen and thawed twice matched those present in saliva collected from the same individual. Three polymorphisms of ALDH3 (variants I, II, and III) were detected in the 33 saliva samples analyzed. Variants I and II were inherited in each of three generations of a 10-member family.

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FILE 'MEDLINE, CAPLUS, BIOSIS, BIOTECHDS, EMBASE, SCISEARCH' ENTERED AT 11:13:57 ON 05 JAN 2004

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L1            0 S ALDEHYDE DEGROGENASE AND GLYCEROL DEHYDRATASE AND 3-HYDROXYPR
L2            0 S ALDEHYDE DEDROGENASE AND GLYCEROL DEHYDRATASE AND 3-HYDROXYPR
L3            2 S ALDEHYDE DEHYDROGENASE AND GLYCEROL DEHYDRATASE AND 3-HYDROXY
L4            2 S ALDEHYDE DEHYDROGENASE AND DHAB AND 3-HYDROXYPROPIONIC ACID
L5            0 S ALDH4 AND DHAB AND 3-HYDROXYPROPIONIC ACID
L6            0 S ALDH4 AND DHAB
L7           37 S ALDH4
L8           13 DUP REM L7 (24 DUPLICATES REMOVED)
L9           13 FOCUS L8 1-
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LOGOFF? (Y)/N/HOLD:y

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FULL ESTIMATED COST	91.07	91.28

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CA SUBSCRIBER PRICE	-1.30	-1.30

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Search Results - Record(s) 1 through 4 of 4 returned.

☐ 1. Document ID: US 20020142406 A1

L1: Entry 1 of 4 File: PGPB Oct 3, 2002

PGPUB-DOCUMENT-NUMBER: 20020142406
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020142406 A1

TITLE: Polyhydroxyalkanoate production from polyols

PUBLICATION-DATE: October 3, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Skraly, Frank A.	Boston	MA	US	
Peoples, Oliver P.	Arlington	MA	US	

US-CL-CURRENT: 435/135; 435/252.3, 435/320.1, 435/476, 800/278

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

☐ 2. Document ID: US 6576450 B2

L1: Entry 2 of 4 File: USPT Jun 10, 2003

US-PAT-NO: 6576450
DOCUMENT-IDENTIFIER: US 6576450 B2

TITLE: Polyhydroxyalkanoate production from polyols

DATE-ISSUED: June 10, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Skraly; Frank A.	Boston	MA		
Peoples; Oliver P.	Arlington	MA		

US-CL-CURRENT: 435/135

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

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☐ 3. Document ID: US 6329183 B1

L1: Entry 3 of 4 File: USPT Dec 11, 2001

US-PAT-NO: 6329183
DOCUMENT-IDENTIFIER: US 6329183 B1
** See image for Certificate of Correction **

TITLE: Polyhydroxyalkanoate production from polyols

DATE-ISSUED: December 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Skraly; Frank A.	Boston	MA		
Peoples; Oliver P.	Arlington	MA		

US-CL-CURRENT: 435/135

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

☐ 4. Document ID: WO 200116346 A1, BR 200008355 A, AU 200070936 A, EP 1124979 A1

L1: Entry 4 of 4 File: DWPI Mar 8, 2001

DERWENT-ACC-NO: 2001-315988
DERWENT-WEEK: 200255
COPYRIGHT 2004 DERWENT INFORMATION LTD
TITLE: 3-Hydroxypropionic acid preparation, for use e.g. as monomer, by fermenting recombinant microorganisms expressing genes for suitable enzymes in the presence of glycerol or glucose

INVENTOR: CAMERON, D C; SUTHERS, P F

PRIORITY-DATA: 1999US-151440P (August 30, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200116346 A1	March 8, 2001	E	063	C12P007/22
BR 200008355 A	July 16, 2002		000	C12P007/22
AU 200070936 A	March 26, 2001		000	C12P007/22
EP 1124979 A1	August 22, 2001	E	000	C12P007/22

INT-CL (IPC): C12 N 1/20; C12 N 9/02; C12 N 9/14; C12 N 15/00; C12 P 7/22

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

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Terms	Documents
3-hydroxypropionic acid and glycerol dehydratase	4

Display Format: - Change Format

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L1: Entry 1 of 4 File: PGPB Oct 3, 2002

PGPUB-DOCUMENT-NUMBER: 20020142406
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020142406 A1

TITLE: Polyhydroxyalkanoate production from polyols

PUBLICATION-DATE: October 3, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Skraly, Frank A.	Boston	MA	US	
Peoples, Oliver P.	Arlington	MA	US	

US-CL-CURRENT: 435/135; 435/252.3, 435/320.1, 435/476, 800/278

CLAIMS:

We claim:

1. A method for producing polyhydroxyalkanoates comprising providing genetically engineered organisms which express enzymes selected from the group consisting of vicinal diol hydratase, acyl-CoA transferase, acyl-CoA synthetase .beta.-ketothiolase, acetoacetyl-CoA reductase, PHA synthase, glycerol-3-phosphate dehydrogenase and glycerol-3-phosphatase, providing diols which can be converted into 3-hydroxypropionate or 3hydroxyvalerate monomers by enzymes expressed by the organisms, and and culturing the organisms under conditions wherein 3-hydroxypropionate or 3-hydroxyvalerate is converted to monomers which are polymerized to form polyhydroxyalkanoates.

2. The method of claim 1 wherein the organisms are bacteria.

3. The method of claim 1 wherein the organisms are plants.

4. The method of claim 1 wherein the organisms are genetically engineered with plasmids encoding one or more of the enzymes.

5. The method of claim 1 wherein the organisms are genetically engineered to incorporate the genes encoding the enzymes into the chromosome.

6. The method of claim 1 wherein the diols are selected from the group consisting of 1,2-propanediol, 1,3 propanediol and glycerol.

7. The method of claim 1 wherein the dehydratases are selected from the group consisting of glycerol dehydratase and diol dehydratase.

8. The method of claim 1 wherein the diols which are converted to monomers selected from the group consisting of 3-hydroxypropionate or 3-hydroxyvalerate monomers.

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9. The method of claim 1 further comprising providing genes encoding an enzyme selected from the group consisting of aldehyde dehydrogenase and 1,3-propanediol oxidoreductase.

10. A system for making polyhydroxyalkanoates comprising an organism genetically engineered to express enzymes selected from the group consisting of a vicinal diol dehydratase, acyl-CoA transferase, acyl-CoA synthetase .beta.-ketothiolase, acetoacetyl-CoA reductase, PHA synthase, glycerol-3-phosphate dehydrogenase and glycerol-3-phosphatase, wherein the organism can convert diols into 3-hydroxypropionate or 3-hydroxyvalerate monomers which are polymerized to form polyhydroxyalkanoates.

11. The system of claim 10 wherein the organisms are bacteria.

12. The system of claim 10 wherein the organisms are plants.

13. The system of claim 10 wherein the organisms are genetically engineered with plasmids encoding one or more of the enzymes.

14. The system of claim 10 wherein the organisms are genetically engineered to incorporate the genes encoding the enzymes into the chromosome.

15. The system of claim 10 further comprising coenzyme B-12.

16. The system of claim 10 wherein the vicinal diol dehydratase is selected from the group consisting of glycerol dehydratase and diol dehydratase.

17. The system of claim 10 further comprising genes encoding an enzyme selected from the group consisting of aldehyde dehydrogenase and 1,3-propanediol oxidoreductase.

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L1: Entry 1 of 4 File: PGPB Oct 3, 2002

PGPUB-DOCUMENT-NUMBER: 20020142406
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020142406 A1

TITLE: Polyhydroxyalkanoate production from polyols

PUBLICATION-DATE: October 3, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Skraly, Frank A.	Boston	MA	US	
Peoples, Oliver P.	Arlington	MA	US	

APPL-NO: 09/ 944243 [PALM]
DATE FILED: August 30, 2001

RELATED-US-APPL-DATA:
Application 09/944243 is a continuation-of US application 09/366920, filed August 4, 1999, PENDING
Application is a non-provisional-of-provisional application 60/095329, filed August 4, 1998,

INT-CL: [07] C12 P 7/62, C12 N 1/21, A01 H 5/00, C12 N 15/74

US-CL-PUBLISHED: 435/135; 435/320.1, 435/252.3, 800/278, 435/476
US-CL-CURRENT: 435/135; 435/252.3, 435/320.1, 435/476, 800/278

REPRESENTATIVE-FIGURES: NONE

ABSTRACT:

Organisms are provided which express enzymes such as glycerol dehydratase, diol dehydratase, acyl-CoA transferase, acyl-CoA synthetase .beta.-ketothiolase, acetoacetyl-CoA reductase, PHA synthase, glycerol-3-phosphate dehydrogenase and glycerol-3-phosphatase, which are useful for the production of PHAs. In some cases one or more of these genes are native to the host organism and the remainder are provided from transgenes. These organisms produce poly(3-hydroxyalkanoate) homopolymers or co-polymers incorporating 3-hydroxypropionate or 3-hydroxyvalerate monomers wherein the 3-hydroxypropionate and 3-hydroxyvalreate units are derived from the enzyme catalysed conversion of diols. Suitable diols that can be used include 1,2-propanediol, 1,3 propanediol and glycerol. Biochemical pathways for obtaining the glycerol from normal cellular metabolites are also described. The PHA polymers are readily recovered and industrially useful as polymers or as starting materials for a range of chemical intermediates including 1,3-propanediol, 3-hydroxypropionaldehyde, acrylics, malonic acid, esters and amines.

CROSS-REFERENCE TO RELATED APPLICATIONS

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[0001] Priority is claimed to U.S. provisional application Ser. No. 60/095,329 filed Aug. 4, 1998.

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Detailed Description Text (3):
1,2-propanediol and glycerol are inexpensive substrates that are non toxic to many microorganisms even at high concentrations. 1,3-propanediol can be produced from renewable resources (Anton, D. "Biological production of 1,3-propanediol", presented at United Engineering Foundation Metabolic Engineering II conference, Elmau, Germany, Oct. 27, 1998). 1,2-propanediol is present in industrial waste streams from production of propylene glycol. Glycerol can also be obtained from metabolism in a number of microbes and plant crops. In many cases, these are superior feedstocks for fermentation as compared to organic acids, which generally become toxic at low concentrations to many microorganisms. 3-Hydroxypropionic acid is not chemically stable and therefore is not commercially available.

h e b b g e e e f c e f e ge